

REMARKS

Claims 1-46 are pending in this application, claims 1-13 having been withdrawn from consideration. By this Amendment, claims 14, 23, 27, 28, 33, 37, 43 and 46 are amended. Support for the amendments to claims 14, 23, 27, 28, 33, 37, 43 and 46 can be found, for example, in the instant specification at paragraphs [0075] and [0079] and in original claims 14, 23, 27, 28, 33, 37, 43 and 46. No new matter is added. In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

Information Disclosure Statement

An Information Disclosure Statement with Form PTO-1449 was filed in the above-captioned patent application on March 29, 2005. Applicants have not yet received from the Examiner a copy of the Form PTO-1449 initialed to acknowledge the fact that the Examiner has considered the disclosed information. The Examiner is requested to initial and return to the undersigned a copy of the Form PTO-1449. For the convenience of the Examiner, a copy of that form is attached.

Rejection Under 35 U.S.C. §102

The Office Action rejects claims 14-20 under 35 U.S.C. §102(b) over Teng et al., "Platinum-Maghemite Core-Shell Nanoparticles Using a Sequential Synthesis," Nano Letters, 3(2):261-64 (2003) ("Teng"). Applicants respectfully traverse the rejection.

Claim 14 recites "[a] method of forming nanoparticles, comprising: forming a solution of a reducing agent and a solvent under an inert gas; heating the solution to reflux; adding a metal salt or organic metallic compound to the solution to form nanoparticle cores; adding an organometallic compound to the solution and heating to form core-shell nanoparticles by forming one or more shell layers over the nanoparticle cores; and heating the core-shell nanoparticles to form the nanoparticles, the nanoparticles being different from the core-shell

nanoparticles" (emphasis added). Teng would not have anticipated or rendered obvious such a method.

The Office Action asserts that Teng discloses a process for forming core-shell nanoparticles substantially identical to that recited in the instant claims. In particular, the Office Action asserts that Teng discloses the use the process steps and specific chemicals recited in the instant claims. Notwithstanding these assertions, Teng does not teach or suggest the method of claim 14.

Claim 14 requires formation of core-shell nanoparticles followed by heating of those core-shell nanoparticles to form nanoparticles that are different from the core-shell nanoparticles. While Teng discloses the formation of core-shell nanoparticles, there is no teaching or suggestion in Teng that the formed core-shell nanoparticles could or should be further heated to form different nanoparticles. As Teng does not teach or suggest "heating the core-shell nanoparticles to form the nanoparticles, the nanoparticles being different from the core-shell nanoparticles," Teng does not teach or suggest each and every limitation of claim 14.

Claim 14 is not anticipated by Teng. Claims 15-20 depend from claim 14 and, thus, also are not anticipated by Teng. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Rejections Under 35 U.S.C. §103

A. Teng

The Office Action rejects claims 21 and 22 under 35 U.S.C. §103(a) over Teng. Applicants respectfully traverse the rejection.

Claim 14 is set forth above. As discussed above, Teng does not teach or suggest "heating the core-shell nanoparticles to form the nanoparticles, the nanoparticles being

different from the core-shell nanoparticles," as recited in claim 14, and thus does not teach or suggest each and every limitation of claim 14.

Claim 14 would not have been rendered obvious by Teng. Claims 21 and 22 depend from claim 14 and, thus, also would not have been rendered obvious by Teng. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. Teng in view of Hattori

The Office Action rejects claims 23-46 under 35 U.S.C. §103(a) over Teng in view of U.S. Patent Application Publication No. 2004/0020327 to Hattori et al. ("Hattori").

Applicants respectfully traverse the rejection.

Claim 23 recites "[a] method of forming magnetic alloy nanoparticles, comprising: forming a solution of a reducing agent and a solvent under an inert gas; heating the solution to reflux; adding a metal salt or organic metallic compound to the solution to form nanoparticle cores; adding an organometallic compound to the solution and heating to form core-shell nanoparticles by forming one or more shell layers over the nanoparticle cores; transferring the core-shell nanoparticles to a substrate; and thermally annealing the core-shell nanoparticles on the substrate to reduce the one or more shell layers and form exchange coupled magnetic alloy nanoparticles" (emphasis added). Claim 28 recites "thermally annealing the core-shell nanoparticles to reduce the one or more shell layers and form an exchange coupled magnetic alloy thin film" (emphasis added). Claim 37 recites "thermally annealing the core-shell nanoparticles to reduce the one or more shell layers and form an exchange coupled alloy magnet" (emphasis added). Claim 43 recites "thermally annealing the core-shell nanoparticles to reduce the one or more shell layers and form second core-shell nanoparticles, the second core-shell nanoparticles being different from the first core-shell nanoparticles" (emphasis added). Teng would not have rendered obvious such methods. Hattori does not remedy the deficiencies of Teng.

The Office Action relies on Teng for its alleged teaching of the process steps and specific chemicals recited in the instant claims to obtain core-shell nanoparticles. The Office Action concedes that Teng does not teach or suggest heating those nanoparticles to obtain a secondary material. However, the Office Action asserts that Hattori remedies the deficiencies of Teng through its disclosure of annealing magnetic nanoparticles to form magnetic recording media. Notwithstanding these assertions, Teng and Hattori do not teach or suggest the methods of claims 23, 28, 37 and 43.

Each of claims 23, 28, 37 and 43 (and claim 14 discussed above) requires that a formed core-shell nanoparticle be subjected to heat to form a secondary material. As admitted in the Office Action, Teng does not teach or suggest such a heating step. Hattori discloses applying a nanoparticle dispersion to a magnetic support to form a magnetic layer and subsequently subjecting the magnetic layer to an annealing process. *See, e.g.*, paragraphs [0056] and [0060]. However, there is no teaching or suggestion in Hattori that the disclosed nanoparticle dispersion comprises core-shell nanoparticles. Hattori only discloses application an annealing process to ordered alloy nanoparticles to form magnetic recording media. *See, e.g.*, paragraphs [0021], [0022], [0088], [0098] and [0105].

Hattori, instead, teaches away from using core-shell nanoparticles to form magnetic recording media. In particular, Hattori teaches employing particular method steps specifically to avoid formation of core-shell nanoparticles. Hattori states that:

In the reducing step, the base metal is reduced first and then the noble metal is reduced, or the base metal and a part of the noble metal are reduced first and then the remainder of the noble metal is reduced. By reducing the base metal first ... both metals are relatively uniformly incorporated, and composition of each particle becomes uniform. On the other hand, in case the noble metal is reduced first, there is obtained so-called core/shell structure ...

See paragraphs [0016] and [0017] (emphasis added). Hattori disfavors obtaining core-shell nanoparticles, and thus cannot be said to teach or suggest annealing such core-shell nanoparticles to obtain magnetic recording media.

One of ordinary skill in the art would not expect that the annealing step of Hattori would be applicable to core-shell nanoparticles yielded by the method of Teng because (a) Hattori does not teach or suggest the applicability of the annealing step to core-shell nanoparticles, and (b) Hattori teaches away from using core-shell nanoparticles at all. Accordingly, Teng and Hattori do not teach or suggest heating a core-shell nanoparticle to obtain a secondary material, and one of ordinary skill in the art would not have attempted to combine the teachings of Teng and Hattori to obtain the methods of claims 23, 28, 37 and 43.

Claims 23, 28, 37 and 43 would not have been rendered obvious by Teng and Hattori. Claims 24-27, 29-36, 38-42 and 44-46 depend variously from claims 23, 28, 37 and 43 and, thus, also would not have been rendered obvious by Teng and Hattori. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-46 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



William P. Berridge
Registration No. 30,024

Jacob A. Doughty
Registration No. 46,671

WPB:JAD/hs

Attachment:

March 29, 2005 Form PTO-1449

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OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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